Fibre-optic analog ICs to grow 34%; demand shifting to 10 Gb/s and GaAs

According to the study "*Fibre-optic Analog ICs Market*" by **Strategy Analytics Inc** (Tel: +44-1582-405678), GaAs will become the predominant technology in the fibre-optic analog IC market, which is forecast to grow at a compound annual average growth rate (CAAGR) of 34% from US$350m in 1999 to US$1.621bn in 2004.

Also, the demand for increased bandwidth is shifting the focus to the 10 Gb/s market.

"*However, GaAs companies will have to significantly reduce Average Selling Prices in the near future if they are to remain competitive in the face of an on-slaught from silicon-germanium*," says Asif Anwar, an analyst with the firm's GaAs and High Speed Circuits strategic advisory service.

The move towards 10 Gb/s and beyond, and a shift towards a data-centric focus, will result in a shift away from bare dies to modules. There will also be increased integration of trans-impedance amplifiers with the photodetector diodes in small-form-factor modules for use in emerging Gigabit Ethernet and fibre channel datacom markets.

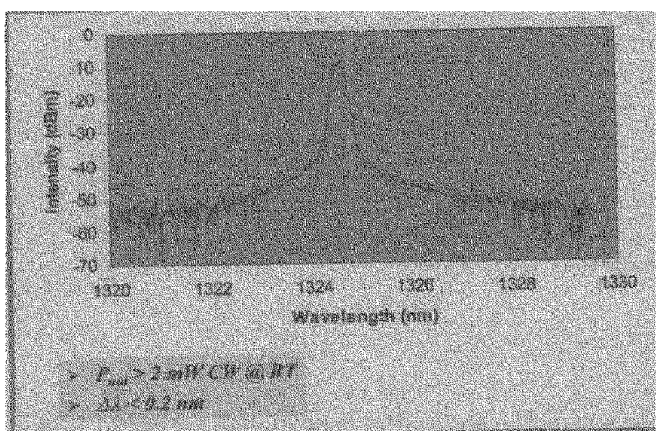
More long-term, the 40 Gb/s market is expected to become the second-largest market for fibre-optic systems by 2004 and will be dominated by demand for InP.

Uncooled single-mode long-wavelength VCSEL for 10 Gb/s Ethernet

Transceiver manufacturer **E2O Communications Inc** (Calabasas, CA, USA) has developed a proprietary long-wavelength VCSEL technology platform.

Initial tests have shown that the lasers operate at 1320 nm in a single transverse and longitudinal mode, with spectral line-widths of less than 0.2 nm. Temperature coefficients are less than 0.1 nm/°C and single-mode cw powers greater than 2 mW.

So far no reported long-wavelength VCSEL results have high-enough single-mode power to support OC192 and 10 Gb/s Ethernet applications for uncooled operation up to 85°C. The primary technological difficulties have been in simultaneously achieving high gain and high-reflectance mirrors for low thresholds; good heat sinking for high power; good optical index, gain and cavity engineering for transverse mode control; and low resistance for higher speed.



Pictured - Intensity versus wavelength (single longitudinal mode) for E2O Communication's 1320 nm VCSEL.

850 nm VCSEL test source

At May's *Conference on Lasers and Electro-Optics* (CLEO) in Baltimore, MD, USA, **New Focus** (San Jose, CA, USA) launched the Model 1780 10 Gb/s 850 nm VCSEL. It is "the first off-the-shelf test source to streamline testing preparation for data communications engineers in the emerging 10 Gb/s Ethernet market," according to project manager Andrew Davidson (enabling manufacturers to achieve earlier time-to-market for their new products). New Focus has shipped beta units for evaluation.

• New Focus is shipping customer qualification samples of two passive products: L-band circulators and thin film muxes (for volume revenues in Q3/2001). Two more passive products should ship in second-half 2001: a hybrid micro-optic device for next-generation optical amplifiers and an interleaver. In Q3, plans are to start shipments of a new active product line of 12.5 Gb/s data drivers.

As well as serving as a base reference, with the New Focus Model 1580 Receiver, the two devices in tandem enable testing of the fibre itself.

10 Gb/s serial transponder

Cielo Communications (Broomfield, CO, USA) is sampling a VCSEL-based 10 Gb/s 850 nm serial transponder (for volume production from July) for OC-192 Very Short Reach (VSR), 10 Gigabit Ethernet and proprietary backplane interconnects up to 300 m in length.

Other products for VSR use either 1310 nm serial or 850 nm parallel solutions. The 1310 nm serial solution offers architectural simplicity, but suffers from high power consumption and the high packaging costs of more expensive 1310 nm edge-emitter lasers and single-mode optics; 850 nm parallel solutions have low power dissipation and the lower costs of VCSELs and multi-mode optics, but involve more complicated interconnect designs using multiple devices and parallel optic components.

The transponder offers "a high-speed serial solution over MMF that is less expensive, requires less than half the power, and is half the size" said product marketing manager Jeff Bisberg.

• After shipping VCSEL-based products since 1999, **Picolight** (Boulder, CO, USA) has introduced its first 10 Gb/s 300-pin VCSEL-based short-wavelength optical transponder for 10 Gigabit Ethernet and OC-192 SONET networks (compact and with low power dissipation for Very Short Reach broadband fibre-optic applications).

Picolight was founded in 1995 by CTO and Chairman Jack L Jewell as a spin-out of Vixel Corp (originally Photonics Research Inc and one of the earliest VCSEL developers), which Jewell co-founded in 1991.